AMENDMENTS TO THE SPECIFICATION

Please add the following paragraph on page 1, following the title on line 1:

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a continuation of co-pending US patent application serial number 09/808,807 filed on March 15, 2001.

Paragraph beginning at line 24 of page 23 has been amended as follows:

The structure of the case 8 will be described with reference mainly to Figs. 3A to 3C [[Fig. 3]] to Figs. 5A and 5B [[Fig. 5]].

Paragraph beginning at line 9 of page 25 has been amended as follows:

As shown in Fig. 5A, a convex part 8-10 is formed over the top of the thick part 8-7 that comes in contact with the lid. As shown in Fig. 5B, when the lid 8-5 is closed, the convex part 8-10 is engaged with a concave part of the lid 8-5. Consequently, the lid 8-5 is closed without a gap. Two female screws 8-11 are, as shown in Fig. 3A [[3]], threaded in the thick part 8-7. Therefore, a strap or the like can be, if necessary, screwed to the thick part 8-7.

Paragraph beginning at line 17 of page 25 has been amended as follows:

As shown in Figs. 3A and 3B [[Fig. 3]], the rubber shock absorbers 8-1a for absorbing shocks to alleviate the influence of the shocks on the case 8 are

attached to the corners of the case 8 and the four upper corners of the case body 8-4. In whatever posture the case 8 may be dropped to the ground, the shock absorbers 8-1a first come into contact with the ground.

Paragraph beginning at line 7 of page 26 has been amended as follows:

In the present embodiment, as shown in Fig. 4 and Figs. 5A and 5B [[Fig. 5]], the shock absorbers 1-b are placed on the inner surface of the case body 8-4 in order to protect the contents of the frame 4 put in the case body 8-4, which is a housing, from shock.

Paragraph beginning at line 10 of page 32 has been amended as follows:

The holder 3-13 of the handle 3-11 is normally turned down as indicated with a dot-dash line in Fig. 7A [[7]], and thus stowed so as not to jut out of the handle cover 3-1. When the handle 3-11 is unused, the handle 3-11 will never bother a user. This is user-friendly.

Paragraph beginning at line 15 of page 32 has been amended as follows:

For rotating the drum 3, the holder 3-13 of the handle 3-11 is raised as indicated with a solid line in Fig. 7A [[7]] to rest parallel to the axis of rotation. At this time, when the holder 3-13 is released, the handle 3-11 is returned to the

original turned state owing to the constraining force of the spring 3-14 incorporated in the holder 3-13.

Paragraph beginning at line 21 of page 33 has been amended as follows:

Next, the structures of the front panel 5 and its surroundings will be described with reference mainly to Figs. 9A, 9B, 9C and 9D [[Fig. 9]] to Fig. 11.

Paragraph beginning at line 24 of page 33 has been amended as follows:

As shown in Fig. 9A, the front panel 5 is shaped like a substantially rectangular plate and made of a resin, and placed to block the entire opening 4-41 of the case body 8-4. A concave part 5-1 shown in Fig. 9D [[5D]] and Fig. 10A is formed over the edge of the front panel 5 that comes into contact with the case body 8-4. A rubber packing 5-2 is fitted in the concave part 5-1 in order to prevent invasion of rainwater or dust into the case body 8-4. The front panel 5 is integrated with the frame 4.

Paragraph beginning at line 12 of page 34 has been amended as follows:

A partition 5-6 surrounds the ac receptacle 5-4 and dc receptacle 5-5. A rainproof cover 5-7 is fixed in order to block an opening defined with the partition 5-6. As shown in Figs. 10A and 10B [[Fig.10]], the partition 5-6 has a small window 5-8. The rainproof cover 5-7 is closed by tightening a thumb screw

5-10 with a convex part 5-9 formed on the rainproof cover 5-7 fitted into the small window 5-8.

Paragraph beginning at line 20 of page 35 has been amended as follows:

The three vents 5-15 [[5-16]], 5-16 [[5-17]] and 5-17 [[5-18]] has a means devised for fear rainwater or the like may invade Into the case through the vents. For example, as shown in Fig. 9D, an exhaust opening 5-18 may open sideways as part of the second exhaust vent 5-17. A plurality of eaves 5-19 may be formed in order to prevent invasion of rainwater or the like through the opening 5-18.

Paragraph beginning at line 18 of page 39 has been amended as follows:

As shown in Fig. 12A and Fig. 15A [[15]], the second side panel 3-7 has a thick part 3-17 as the outer edge thereof, and a gear 3-18 is formed on the periphery of the thick part 3-17. As shown in Fig. 15A [[15]], the gear 3-18 conveys rotation to a gear 4-43 included in a rotation sensor 4-42 that senses the number of rotations made by the drum 3 about which the insertion member 2-1 is wound.

Paragraph beginning at line 18 of page 44 has been amended as follows:

As partly shown in Fig. 12A [[12]], Fig. 14, and Figs. 15A and 15B [[Fig. 15]], the frame 4 consists of the first frame 4-3, the second frame 4-4, a locking member 4-5, a power supply 4-6, the rotation sensor 4-42, a stopper 4-7, a detent 4-8, and a restricting member 4-9. The locking member 4-5 links the first frame 4-3 and second frame 4-4. The rotation sensor 4-42 senses the number of rotations made by the drum 3. The stopper 4-7 prevents the insertion member 2-1 from being excessively taken up or drawn out. The detent 4-8 prevents rotation of the drum during transportation of the case. The restricting member 4-9 prevents the insertion member 2-1 from spreading outwards.

Paragraph beginning at line 13 of page 45 has been amended as follows:

As shown in Fig. 12A [[12]] and Fig. 13A, the V-shaped part 4-11 is engaged with the grooves of a plurality of bearing members 4-12, for example, three or four bearing members 4-12.

Paragraph beginning at line 10 of page 47 has been amended as follows:

As shown in Figs. 15A and 15B [[Fig. 15]], a shaft 4-13 for sensing the number of rotations is located in the vicinity of the drum 3, or more particularly, under the bottom of the drum 3. The shaft 4-13 lies parallel to the axis of rotation of the drum 3, and penetrates through the first frame 4-3 and second

frame 4-4. Both ends of the shaft 4-13 are rotatably held in holding members 4-14 freely. The holding members 4-14 are fixed to predetermined points on the frames 4-3 and 4-4 respectively, and exhibits a low coefficient of friction. A gear 4-43 is attached to the shaft 4-13 so that the gear 4-43 will be engaged with the gear 3-18 formed on the periphery of the second side panel 3-7.

Paragraph beginning at line 4 of page 50 has been amended as follows:

As seen from Figs. 15A and 15B [[Fig. 15]], the number of teeth of the gear 3-18, which is formed on the drum 3, engaged during one rotation thereof is much larger than the number of teeth the gear 4-43, which is attached to the shaft 4-13, engaged during one rotation thereof. With one rotation of the drum 3 [[1]], the shaft 4-13 rotates a plurality of times.

Paragraph beginning at line 15 of page 56 has been amended as follows:

Next, a description will be made of the structure of the detent [[stopper]] 4-8 for preventing rotation of the drum during transportation.

Paragraph beginning at line 22 of page 64 has been amended as follows:

As shown in Fig. 24B [[24]], a female screw hole [[7-30]] and two slit-like grooves 7-32 are formed in the lower part of the liquid crystal monitor 7-3. A locking screw 7-30 that is a male screw is so formed on the panning head 7-29 as

to permit free rotation. The liquid crystal monitor 7-3 is thus fixed to the panning head so that the liquid crystal monitor 7-3 can be unfixed freely. Detent pins 7-31 are located to coincide with the two slit-like grooves. Therefore, the liquid crystal monitor 7-3 will not rotate once fixed.

Paragraph beginning at line 4 of page 67 has been amended as follows:

A rear cap 3-69 attached to the rear end of the insertion member 2-1 is fixed to the locking member 3-50a [[3-50]], whereby the insertion member 2-1 is coupled to the motor-driven angling unit 3-37.

Paragraph beginning at line 8 of page 67 has been amended as follows:

The coil pipes 33d, 33u, 33i, and 33r extending from the end of the insertion member after passing through the insertion member 2-1 pass through the rear cap 3-69 and locking member 3-50a [[3-50]]. The coil pipes 33d, 33u, 33i, and 33r are then fixed to the coil pipe bearer 3-50b [[3-51]] with coil pipe stoppers 3-70, 3-71, 3-72, and 3-73 attached to the ends thereof.

Paragraph beginning at line 14 of page 75 has been amended as follows:

Moreover, the angulation wires 32u and 32d used to bend the bending section 2-3 vertically are coupled to the sprocket 38a of the vertical driving motor 37a included in the motor-driven angling unit 3-37. When the joystick 6-2 is

tilted, the motor 37a is driven to rotate by an angle control CPU 39 and a driving amplifier 40a included in the motor-driven angling control [[drive]] circuit unit 3-38. Consequently, the bending section 2-3 is bent upwards or downwards.

Paragraph beginning at line 20 of page 81 has been amended as follows:

Moreover, if the power supply for the motor 37a or motor-driven angling control [[drive]] circuit unit 3-38 is not turned on unless the insertion member enters the state encouraging acceptance of a request for angling the insertion member (step S7 in Fig. 31), power can be saved.

Paragraph beginning at line 2 of page 83 has been amended as follows:

If the number of turns falls below m, motor-driven angle controlling is enabled at step S19. Power is supplied to the motor-driven angling control [[drive]] circuit unit 3-38 and motor-driven angling unit 3-37, whereby a request for motor-driven angling can be accepted. At step S20, Angle Controlling Disabled is non-displayed, and an indication indicating that the request for motor-driven angling can be accepted is displayed. Alternatively, Angle Controlling Enabled may be displayed or temporarily displayed at the time of transition from enabling angle controlling to disabling angle controlling or vice versa.

Paragraph beginning at line 10 of page 84 has been amended as follows:

Next, a second embodiment of the present invention will be described with reference to Fig. 33 and Figs. 34A and 34B [[Fig. 34]]. The present embodiment is identical to the first embodiment in terms of the system configuration. However, an operation program employed in the present embodiment is different from that in the first embodiment. Whether the light source lamp 44 should be activated or inactivated is controlled based on the wound state of the insertion member 2-1.

Paragraph beginning at line 9 of page 85 has been amended as follows:

In contrast, when the insertion member is drawn out from the housing by a length large enough to achieve observation properly, the number of rotations of the drum exceeds the threshold from which the system control CPU 42 [[44]] judges that the light source lamp 44 should be inactivated. It is therefore judged from the number of rotations that the light source lamp 44 may be activated. The system control CPU 42 issues an activation enabling instruction to the light source lamp 44 and allows supply of power to the light source lamp 44. The light source lamp 44 is then lit. Illumination light is then propagated over the light guide 21 (see Fig. 2), which runs through the insertion member 2-1, and supplied to the imaging system.

Paragraph beginning at line 3 of page 86 has been amended as follows:

As shown in Fig. 34A, when the power switch is turned on, the system power supply is turned on at step S21. At step S22, the state of the tip of the insertion member 2-1 is sensed based on data sent from the number-of-rotations sensing mechanism [[means]].

Paragraph beginning at line 21 of page 87 has been amended as follows:

Specifically, in the endoscope system 1 of the first embodiment, when the insertion member 2-1 is wound about the drum 3 at the completion of an inspection, the motor-driven angling control [[drive]] circuit unit 3-38 issues a bending section locking instruction to the motor 37a. The bending section locking instruction instructs that the bending section should be held bent. When an attempt is made to stow the insertion member with the bending section 2-3 held bent, the number of rotations of the drum 3 acquired at the sliding variable resistor 4-20 exceeds the threshold from which it is judged whether motor-driven angling is enabled or disabled. When the number of rotations falls within the range leading to the judgment that motor-driven angling should be disabled, the system control CPU 42 issues an instruction, which instructs the motor-driven angling should be disabled, to the motor-driven angling drive circuit unit 3-38.

Paragraph beginning at line 10 of page 91 has been amended as foll ws:

In contrast, when the insertion member 2-1 is drawn out of the housing by a length large enough to achieve observation, the number of rotations of the drum 3 exceeds the threshold from which the system control CPU 42 judges whether the CCU 3-39 [[44]] should be inactivated. The system control CPU 42 then judges from the number of rotations that the CCU may be activated. The system control CPU 42 issues an activation enabling instruction to the CCU 3-39 and allows supply of power to the CCU 3-39. Consequently, a view image is displayed on the monitor owing to the abilities of the CCU 3-39.

Paragraph beginning at line 15 of page 92 has been amended as follows:

In the endoscope system 1 of the first embodiment, software is used to set an angle of bending to a maximum value instead of a mechanical stopper that is not shown. The mechanical stopper is included in a wire pulling mechanism for setting an angle of bending to a maximum value. Specifically, the system control CPU 42 issues an instruction, which instructs bending of the bending section 2-3 to the greatest extent, to the motor-driven angling control [[drive]] circuit unit 3-38. The motor-driven angling control [[drive]] circuit unit 3-38 gives control to pull the angulation wires until the angle of bending becomes the maximum value determined by software.

Paragraph beginning at line 6 of page 94 has been amended as follows:

In the endoscope system 1 of the first [[fifth]] embodiment, the system control CPU 42 learns a length, by which the insertion member 2-1 is drawn out of the housing, by analyzing analog data acquired at the sliding variable resistor 4-20 and transferred from the number-of-drum rotations sensing mechanism.

Paragraph beginning at line 12 of page 94 has been amended as follows:

The system control CPU 42 sets a maximum angle of bending in relation to a length by which the insertion member 2-1 is drawn out, and transmits an angling instruction to the motor-driven angling drive circuit unit 3-38. In response to the angling instruction, the motor-driven angling control [[drive]] circuit unit 3-38 controls the motor 37a or the like according to the maximum angle of bending set in relation to the length by which the insertion member 2-1 is drawn out. The motor-driven angling control circuit [[drive]] unit 3-38 thus changes a magnitude of traction to be exerted in pulling the angulation wires. The job of setting the maximum angle of bending may be assigned to the motor-driven angling control circuit unit ~~drive printed circuit board~~ 3-38 that receives the number of rotations of the drum.

Paragraph beginning at line 3 of page 95 has been amended as follows:

Think of a case where the insertion member 2-1 is fully drawn out of the housing and straightened and a case where the insertion member 2-1 is drawn out halfway and has a portion thereof still wound about the drum. In the cases, even if the same bending-related information is given to the motor-driven angling control circuit unit ~~control circuit unit~~ 3-38, an angle of bending differs because of friction between channels contained in the insertion member 2-1. When the insertion member 2-1 has a portion thereof still wound about the drum 3, the angle of bending is smaller than that attained when the insertion member is straightened.

Paragraph beginning at line 25 of page 96 has been amended as follows:

A seventh ~~second~~ embodiment of the present invention will be described with reference to Fig. 36 and Fig. 37.

Paragraph beginning at line 19 of page 101 has been amended as follows:

An eighth [[third]] embodiment of the present invention will be described with reference to Fig. 38.

Paragraph beginning at line 6 of page 103 has been amended as follows:

According to the present embodiment, the rotation of the drum 3 is conveyed to the multi-rotation variable resistor 4-52 [[5-52]] via the speed reducer 4-53. The number of rotations of the drum 3 can be converted into an electric signal. Consequently, a length by which the insertion member 2-1 is wound about the drum 3, or in other words, how long the insertion member 2-1 is wound about the drum can be detected.

Paragraph beginning at line 14 of page 104 has been amended as follows:

In this case, the number-of-rotations sensing mechanism [[means]] has the capability of a nonvolatile storage similarly to the one employed in the first embodiment. Specifically, even if the power supply is turned on after being turned off, a length by which the insertion member 2-1 is wound can be detected based on the resistance.

Paragraph beginning at line 21 of page 103 has been amended as follows:

A ninth ~~fourth~~ embodiment of the present invention will be described with reference to Fig. 39 to Figs. 43A and 43B [[Fig. 43]].

Paragraph beginning at line 22 of page 105 has been amended as follows:

As shown in Fig. 42 [[41]], the proximal part of the insertion member 42-1 of the industrial endoscope 42 is fastened to the drum 43. In the present embodiment, the shaft 52 fixed to the center of the drum 43 is linked to the mount 55 fixed to the rotational panel 47 with the bearing 53 and one-way clutch 54 between them. When the rotational panel 47 is rotated in one direction, that is, a direction of rotation permitting winding of the insertion member 42-1 about the drum 43, the drum 43 is rotated together with the rotational panel 47. When the rotational panel 47 is turned in an opposite direction, the drum 43 will not be rotated.

Paragraph beginning at line 14 of page 108 has been amended as follows:

In other words, as shown in Fig. 43B, when the presser member 54a is rotated, the rollers 54c are settled inside the inner surfaces 54d of the presser member 54c while being restricted by the spacers ~~holding pieces~~ 54b but not brought into contact with the inner surfaces 54d. In this state, the rollers 54c convey no torque.

Paragraph beginning at line 8 of page 109 has been amended as follows:

A tenth [[fifth]] embodiment of the present invention will be described with reference to Fig. 44 to Fig. 46.

Paragraph beginning at line 10 of page 109 has been amended as follows:

In the ninth ~~fourth~~ embodiment, the bearing 53 [[52]] and one-way clutch 54 are interposed between the shaft 52 and the mount 55 mounted on the periphery of the shaft 52. In the present embodiment, a bearing 57 is, as shown in Fig. 44, fitted in the mount 55. A gear 58 is formed on the periphery of the mount 55, and a gear 59 is located at a position at which the gear 59 is engaged with the gear 58.

Paragraph beginning at line 24 of page 109 has been amended as follows:

Similarly to the ninth ~~fourth~~ embodiment, when the lever 56 is used to turn the rotational panel 47 in the direction of rotation permitting taking up of the industrial endoscope 42, the one-way clutch 60 and shaft 61 are engaged with each other. This causes the drum 43 to rotate.

Paragraph beginning at line 14 of page 110 has been amended as follows:

As mentioned above, the present embodiment provides the same advantage as the ninth ~~fourth~~ embodiment. In addition, a mechanism for rotating and bearing the shaft 52 can be constructed easily.

Paragraph beginning at line 19 of page 110 has been amended as follows:

An eleventh [[sixth]] embodiment of the present invention will be described with reference to Fig. 48 to Figs. 50A and 50B [[Fig. 50]].

Paragraph beginning at line 11 of page 112 has been amended as follows:

In contrast, when the rotational panel 47 is turned in the direction of rotation permitting drawing out of the industrial endoscope 2, the claw 64 and sprocket 63 are, as shown in Fig. 50B, not engaged with each other. The drum 43 is not rotated. The present invention provides nearly the same advantage as the tenth [[fifth]] embodiment.

Paragraph beginning at line 18 of page 112 has been amended as follows:

A twelfth ~~seventh~~ embodiment of the present invention will be described with reference to Fig. 51 and Fig. 52.

Paragraph beginning at line 20 of page 112 has been amended as follows:

As shown in Fig. 52, the present embodiment has a gear 69 formed on the periphery of the drum 43 employed in the ninth ~~fourth~~ embodiment. A small hollow gear 70 is located so that it will be engaged with the gear 69. An outer ring 71b of a hollow torque limiter 71 for restricting rotation is fixed to the small gear

70 so that the small gear 70 will be rotated with torque whose level is equal to or larger than a certain level.

Paragraph beginning at line 15 of page 114 has been amended as follows:

Fig. 53 to Fig. 58 are concerned with a thirteenth embodiment of the present invention. Fig. 53 shows the appearance of an endoscope system including a pneumatically angled endoscope. Figs. 54A to 54D [[Fig. 54]] is an explanatory diagram concerning the structure of an insertion member. Fig. 55 shows the structure of a drum. Fig. 56 shows the structure of a bending section drive unit. Fig. 57 is an explanatory diagram showing in detail a bending section driving mechanism. Fig. 58 shows movements to be made in the bending section driving mechanism.

Paragraph beginning at line 8 of page 121 has been amended as follows:

To begin with, the pressurization mechanism block 241 includes a pressurization motor 245. A screw 246 serving as a driving force converting mechanism is threaded on the driving shaft of the pressurization motor 245. The screw 246 rotates with the rotation of the pressurization motor 245. A mover 247 mounted on the driving shaft can rotate freely and has its movements in longitudinal directions restricted. The mover 247 advances or withdraws with rotation of the screw 246. A detent 259 [[248]] penetrates through the mover 247,

whereby the mover 247 is disabled from rotating and restricted to linear advancement or withdrawal.

Paragraph beginning at line 23 of page 124 has been amended as follows:

After power is supplied, when a rotation command is issued from the control circuit to the pressurization motor 245, the screw 246 rotates. Since the feed mover 247 [[255]] is hindered from rotating by the detent 259 [[248]], the feed mover 255 advances to push the first pressurization piston 243a and second pressurization piston 243b into the first pressurization cylinder 248a and second pressurization cylinder 248b respectively. Consequently, the first air tube 216a and second air tube 216b are pressurized through the first pressurization tube 249a and second pressurization tube 249b respectively.

Paragraph beginning at line 2 of page 127 has been amended as follows:

A tip 303 having an optical system, which will be described later, incorporated therein is formed as the tip of the insertion member 302. A bending section 304 and a flexible tube 305 are concatenated proximally to the tip 303. The bending section 304 is bent by the hydraulic ~~pneumatic~~ angling unit. The drum 301 is rotatably stowed in a case body 306 freely. A power cable is extended from near the center of the drum 301.

Paragraph beginning at line 14 of page 129 has been amended as foll ws:

As shown in Fig. 61, a hydraulic angling unit 328 that is the bending section drive unit, an angling control circuit unit 329, a light source unit 330, and a CCU 331 are incorporated in the drum 301. The light source unit 330 supplies illumination light. The CCU 331 produces a TV picture. The insertion member 302 is coupled to the hydraulic angling unit ~~bending member drive unit~~ 328. The light source unit 330 and hydraulic angling unit ~~bending member drive unit~~ 328 are coupled to each other using a light guide connector that will be described later. The angling control circuit unit 329 is coupled to the hydraulic angling unit ~~bending angling unit~~ 328.

Paragraph beginning at line 3 of page 132 has been amended as follows:

The motors 336 and 343 included in the bending section driving mechanism 333 are connected to the angling control circuit unit 329 over electric cables that are not shown. Moreover, the motors 336 and 343 are controlled by a control circuit, which is not shown, included in the angling control circuit unit 329. The motor-driven angling control circuit unit, that is, the angling control circuit unit 329 is logically connected to an angling device that is not shown. Moreover, an electric cable extended from the CCD 309 incorporated in the tip 303 is led to the CCU 331. The CCU 331 converts an image signal into a TV signal and transfers the TV signal to an imaging device such as a monitor located outside the

drum 301. The CCU 331 includes a power supply that supplies power to the light source unit 330 and angling control circuit unit 329.

Paragraph beginning at line 19 of page 132 has been amended as follows:

When power is supplied to the power supply in the CCU 331 over a power cable, power is supplied to the angling control circuit unit 329 through the CCU 331. An angling command issued responsively to a manipulation performed on the angling device is sent to the motor-driven angling control circuit unit that is the angling control unit 329. The angling control circuit unit 329 converts the command into a control signal that is sent to a motor. The motor rotates in a predetermined direction in response to the control signal.

Paragraph beginning at line 18 of page 133 has been amended as follows:

Specifically, as shown in Fig. 64, for example, the first hydraulic ~~angling~~ piston 340 [[320]] withdraws and the second hydraulic ~~angling~~ piston 347 [[321]] advances. Consequently, the second hydraulic pipe 327 is pressured and the second angling cylinder 323 is pressured. When the second angling cylinder 323 is pressured, the second angling piston 321 is thrust forwards. When the second angling ~~hydraulic~~ piston 321 [[347]] is thrust forwards, the second angling rod 318 is thrust forwards. Accordingly, the first angling rod 317 is pushed back and the first angling piston 320 is pushed back. When the first angling piston 320 is pushed back, the first hydraulic piston 340 is pressured. However, the first

hydraulic piston 340 is pulled by the first motor 336, the pressure within the first hydraulic pipe 326 [[327]] will not be intensified. Consequently, the bending section 304 bends upwards in Fig. 60.